## Contribution submission to the conference Regensburg 2016

**Correlated activity of periodically driven binary networks** —
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Experiments showed that excess synchronous spike events are locked to the phase of LFP beta-oscillations more strongly than spikes not part of such events [Denker et al. 2011, Cereb. Cortex]. To identify the mechanisms by which correlations depend on the phase of the LFP, which primarily reflects input activity, we examine a balanced network of homogeneously connected binary model neurons [Ginzburg et al. 1994, PRE] receiving input from a sinusoidal perturbation. The Glauber dynamics of the network is simulated and approximated by mean-field theory. Treating the periodic input in linear response theory, the cyclostationary first two moments are analytically computed. They agree with their simulated counterparts over a wide parameter range. The zero-time lag correlations consist of two terms, one due to the modulated susceptibility (via the external input and network feedback) and one due to the time-varying autocorrelations. For some parameters, this leads to resonant correlations and non-resonant mean activities. Our results can help to answer the salient question how oscillations in mesoscopic signals and spike correlations interact.

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